

Bandolier *Extra*

Evidence-based health care

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WASTE IN THE NHS: THE PROBLEM, ITS SIZE, AND HOW WE CAN TACKLE IT

Andrew Moore DSc, Editor of Bandolier

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This was the title of a Praefectus' seminar in Holywell Manor in 1999. Holywell Manor is the hall for postgraduate students of Balliol College, and has folk from many different countries studying in any discipline. Being Balliol, they are pretty bright, so the prospect of giving any sort of seminar in front of an audience of economists, geneticists, medics and people with about the sharpest minds around. Scary, but also fun, as Holywell Manor was my home during my first undergraduate year in Oxford, now, unfortunately, a fraction of a century ago.

I survived, and subsequently used information from the seminar in a number of other lectures to health professionals. Much has also appeared in Bandolier or ImpAct, though not in any single place. In any event, people have asked if we could put the essence of the lecture on the Bandolier Internet pages. What follows, then, is a somewhat updated version of the Holywell Manor seminar, with slides where appropriate, and with hypertext links to stories in Bandolier or Impact or the Management section of the Bandolier Internet site.

Some words of caution. The essay that follows will be in a lecture style more than a long, abstract, academic treatise where every i is dotted and every t crossed. Moreover, some people tend to take things as absolutes. This is not about absolutes, but rather a series of examples of how the NHS (and probably other healthcare systems in other parts of the world, however organised) wastes its resources, and how it could do better, perhaps much better, with the resources it has.

This is not a criticism of the (about a million) good people who work in the NHS and who make the NHS work. No private organisation could command the loyalty of its staff in the same way the NHS does, or expect so much of them with so little to give them, either as rewards or as support.

This paper essay mutated from a lecture to an Internet essay which was (and is) linked to a number of topics raised in Bandolier and ImpAct over a number of years. That immediacy of being able to linke directly is lost on paper, so apologies for that. The upside that when articles are a bit long, they get difficult to read on screen. Paper still has its use.

The problem

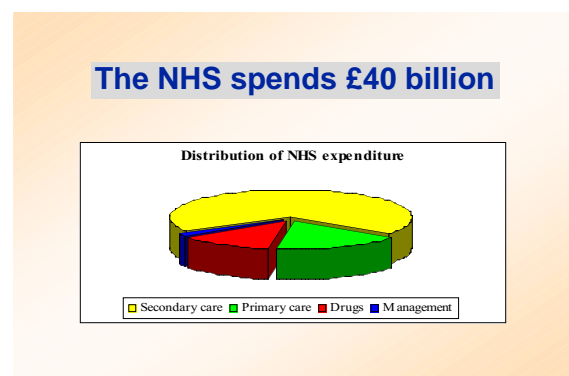
I am a supporter of the NHS, and have worked in and with it for many years. I don't think structural change is an issue. Perhaps structural change is the problem. The endless organisational changes we have suffered in the NHS since 1974 serve mostly to take people's eyes off the simple problems that can be solved and that can make the NHS, or any other organisation, better.

In an industrial environment I learned about the importance of quality control. QC isn't about learning how good you are, but about how bad you are. If you can stop bad things happening, then what remains is better than it was. Continual improvement like that is why we buy Japanese cars and electronics. Compare that with ill-fated Rover cars and its predecessors, which, instead of making models better, just changed to new models with other problems. It might take time, but with time it is easy to see which strategy was the more successful.

That's similar to where we have been in the NHS. We have had little information about what we do and what it costs. That is changing, or even may have changed. We are performing quality checks: audits, even have information about waiting times, and now hospital league tables. These are crude measures of quality, but better than nothing. We need to look more widely at the evidence of areas where there is waste, where there are models of what works, and how we make things work better.

Where are we now?

The NHS budget in 1998/9 was of the order of £40 billion (\$60 billion). The bulk was spent in secondary care, drugs and primary care (slide 1).



Management costs were about £600 million, or 1.5% of the total NHS spend (slide 2). That spending on management is going down, and it covers all sorts of things, including quality monitoring and strategic planning.

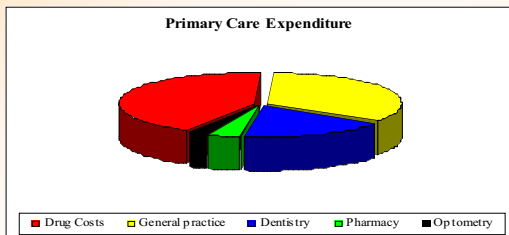
Management costs

- Management currently cost £600 million per year (1.5% of total)
- Expenditure has reduced year-on-year for past three years
- Management costs cover:
 - Strategic planning
 - Hospital management
 - Administrative support
 - Quality monitoring

Is it too much or too little? Who knows? Much of the work of doctors and nurses could be regarded as management, and it is not clear to me what the NHS actually spends on management. And it may not matter, except that an organisation with a £40 billion spend and 1 million employees might be worth a bit of management. The problem is that it is the right type of management that is needed. The NHS is not a grocery store and is different from most organisations.

In primary care (slide 3) a fair chunk of the £7 billion spent every year is spent on drugs, and drugs comprise about 11% of the total NHS spend, growing at about 8% a year (slide 4). This visibility has led to prescribing costs being a major target for cost cutting at every level of the NHS. That

Primary care spends £7 billion



Prescribing costs

- NHS annual drug spending about £5 billion
- 11% of total
- Annual growth 8%
- 90% in primary care

cost cutting has concentrated on the acquisition costs of the drugs. It has not tended to examine the overall balance between increased drug acquisition costs on the one hand and reduced demand for services elsewhere in the service.

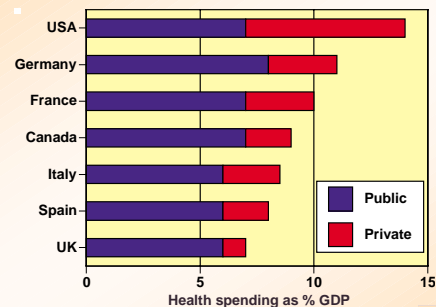
This is understandable because we divvy up the £40 billion between regions and departments, so everyone fights everyone else for a share of the pot. There is no mechanism, or at least one I know of, where excellence is rewarded by increased funding and inadequate performance has funding reduced. Many in the NHS will recognise the reverse picture, of poor performance being rewarded by increased funds. Come in under budget and your budget is cut. Ah well! Not a plea for mindless revolution, just a reminder that the normal rules of the world do not always apply in the NHS.

Take the case of Newcastle and North Tyneside Health Authority. It claims in its most recent annual report a cost-effective record of prescribing because it has the lowest uptake of new drugs in the country, and the prescribing budget is under-spent by 6%. In current NHS think, this is a good record. Ask any audience of doctors how many want to be ill in Newcastle and North Tyneside. So far I have yet to have a single hand go up in any number of different audiences. But more on this later.

Structural issues

There is no getting away from the fact that Britain's NHS is efficient. It works apparent miracles with not a lot. The big difference in health care spending is not what governments spend. In proportion of GDP it is much the same, as slide 5 shows. The difference is in the amounts spent in private provision, or through insurance schemes of individuals or employers. Every other country on the graph has a much bigger private provision than the UK.

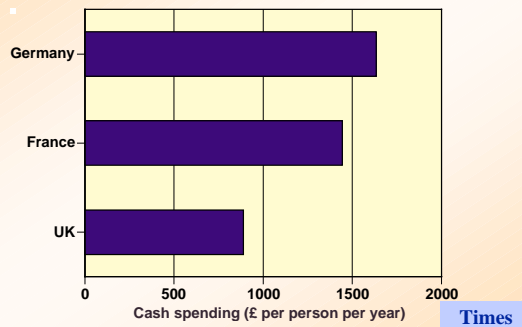
Britain has least private spending



Economist

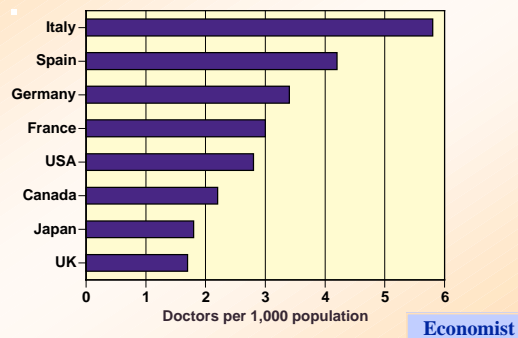
The other thing we have to remember when it comes to spending on the NHS is that we do not spend percentages of GDP. We spend money. In money (cash) terms, the amount spent per person per year in France and Germany is massively more than in the UK (slide 6). Instead of less than £800 per person per year in the UK, France approaches £1500 and Germany about £1600. However you cut it, that is a lot more.

The cash spend gap is big



The other structural issue concerns staff. Britain has far fewer doctors per head of population than most developed countries (slide 7). We train too few (5000 growing to 6000 a year). Attrition rates are substantial, so that of 5000 medical students only about 4000 register with the GMC after training. Part of that difference will be overseas students training in the UK and going home to work. But we register more doctors from overseas every year than we do doctors trained here. The under-supply has become a real problem, which could well become a crisis in the next 5-10 years and thousands of GPs in their 50s retire. Many Asian GPs who came here from Africa and elsewhere will retire, many from city practices. There may be a black hole of 5,000 to 10,000 GPs fewer than we need, out of a total of about 35,000 now. This is not a small problem.

Britain has fewest doctors



What about other grades of staff. I live in Oxford, where house prices are pretty steep. You can pay £140,000 for a small one or two bedroomed house or apartment in the city. A family house with 3 bedrooms in a reasonable area might start at £200,000. What about nurses or laboratory staff, or junior administrators? Look at slide 8. While nurses wage settlements have recently been above inflation, they have been well below UK wage increases generally, and way, way below the 10-20% annual increase in house prices seen in Oxford over recent years.

So many travel from Northampton (40-50 miles) and more every day. And that is why we lose substantial numbers of nurses every year. A local paper told us that 1 in 4 nurses leave every year, 1 in 3 auxiliaries, and 1 in 2 administrators (slide 9). Not great for continuity. Even today (September 2000), as I am writing this, the local hospitals are appealing for ex-NHS staff to return because they cannot run

The inflation problem

- Price inflation 2.2%
- Nurses pay award 3.6%
- UK wage inflation 4.6%
- Oxford house prices 10-20%
- 60%+ of NHS spend is on wages

accident and emergency services without a 12-hour wait. That's right, 12 (twelve) hours!!

Oxfordshire's problems

- Every year 27% of nurses leave
- 1 in 10 nursing posts are vacant
- Every year 34% of auxiliaries leave
- Every year 48% of administrators leave

That is because there are insufficient staff willing or able to work at the salaries offered, despite these same salaries being reasonable in some parts of the UK where housing and other costs are much, much, lower than in Oxford.

These structural problems cannot be ignored. But they are issues for government, and not something that the NHS can itself solve. There are things that the NHS can do, though, to improve itself. That involves tackling waste.

The waste problem

The medical literature is replete with examples of how health services can do better with resources available. Some of these are difficult, some easier. What follows are a series of examples.

1 Laboratory testing

In the UK laboratory based diagnostic testing consumes about £2 billion every year. Bandolier highlighted the immense amount of inappropriate testing that gets done in laboratories (Bandolier 55), with up to a half of all laboratory testing deemed inappropriate. We also know that studies looking at the usefulness of diagnostic tests are poorly reported (Bandolier 26). Even worse, we know that the ways that tests are evaluated, where results from a group of people known to have the disease are compared with those from a group known not to have the disease, are massively bi-

ased (Bandolier 70). This means that they give an incorrect assessment of how good that test is.

If one wanted to be hard-nosed about this, the argument might be that we waste up to half of the money we spend on laboratory testing, or up to £1 billion a year. This may over state the case, but compare it with spending on research to provide better understanding and use of laboratory tests. As far as I know, that is close to zero.

It is not as if we don't know what to do, or even how to do it. We have examples of how to do better. The Ottawa ankle and knee rules save time and money, and save patients from unnecessary X-rays (Bandolier 21; Bandolier 49). The CARE study is powering ahead without much resource (Bandolier 67; Bandolier 70). It can tell us exactly how to diagnose chronic obstructive airways disease (Bandolier 78) without much need for laboratories. Other examples of good testing come along as well using new genetic techniques like viral load for HIV (Bandolier 41) and tuberculosis (Bandolier 79).

Diagnosis and diagnostic testing is a core activity for better healthcare. If you can't diagnose right, how do you treat right? Yet we ignore it. And yet we know that unnecessary testing can be reduced (Bandolier 61), sometimes substantially. Even the simple question of whether routine blood counts were needed on admission to a general medical ward was answered in the negative, with a saving of £3,500 a year (Bandolier 63). Ok, small beer. But that's just one test on one ward. Multiply it across the NHS.

2 Hospital acquired infection

For an individual, hospital acquired infection results in an extra 14 days in hospital, a 10% chance of dying, an extra £3154 spent on healthcare and six extra days off work (slide 10). The economic burden of hospital acquired infection is about £1 billion a year for the NHS in England and affects 1 in 10 patients. The total number of bed days consumed by hospital acquired infection was estimated at about 3.6 million a year, or equivalent to about 27 400-bed hospitals working at 90% capacity. Hospital acquired infection blocks hospital beds and is equivalent to treating an extra 500,000 patients a year (slide 11).

Hospital acquired infection

	No HAI	HAI	HAI effect
Mean costs (£)	1628	4782	3154
Mean stay (days)	8	22	14
Deaths (%)	2	13	11
Mean admission to employment (days)	23	29	6

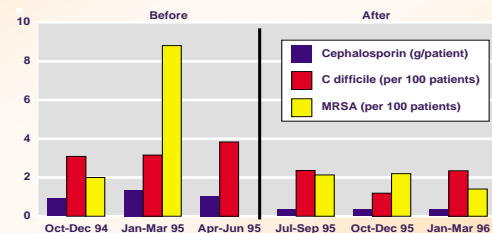
The waste problem 2

- Hospital acquired infection affects up to 500,000 patients each year
- Affects 1 in 10 patients in acute hospitals
- It costs £1 billion a year
- It kills 5,000 patients
- It blocks hospital beds and is equivalent to treating extra 500,000 patients a year
- Equivalent to 24 400-bed acute hospitals

Hospital acquired infection can be halved by instituting simple hand washing regimens (Bandolier 67) (slide 12). Though there has been limited evidence for this, more has recently come to light from Geneva. Washing your hands in hospitals became a problem after the Legionella scares in the late 1970s and early 1980s. Part of the solution was to increase hot water temperatures so that the bugs that caused Legionnaires disease could not thrive.

HAI can be reduced

- Simple measures make a difference
- Hand-washing in a London hospital reduced infections by 50%



An unintended consequence was that washing your hands became difficult. British hospitals generally lack mixer taps. When one is faced with a bowl, without a plug, with scalding hot water from one tap and freezing cold water from the other. You try and work out how to wash your hands without injury or discomfort. It's not possible, and most people stopped washing their hands and hospital acquired infection rates rocketed as a result.

But the size of it beggars belief. There are about 300 major hospitals in the UK. Almost 1 in 10 of them is there just to deal with a problem they cause themselves. Halving the infection rate would be equivalent to building and opening a dozen brand new hospitals!!

3 Adverse drug events

Try and answer this question. Do you think that adverse drug events in hospital cause fewer deaths than road traffic accidents, or about the same, or more deaths than road traffic accidents? Aside from details like what constitutes an adverse drug event, the answer is about this:

There are 3,500 deaths every year on the road in the UK.

There are about 40,000 deaths due to adverse drug events.

Adverse drug events are the third to fifth biggest killers after cancer and heart disease in both the USA and the UK. Study after study report the same (Bandolier 21; Bandolier 52). Ways of dealing with it in our organisations have been discussed (Bandolier 73). We have to recognise that there is a propensity for adverse drug events to be under-reported, with a full chart review and computer analysis producing 50 times more events than voluntary self reporting (slide 13). We should not be surprised, because we have a culture of blame in our health services.

Bias in ADE reporting

Method of detection	Errors (%)
Voluntary self-reporting	0.2
Patient review	0.7
Computer screening	3.8
Chart review	6.5
Chart review + computer	10.0

J Eval Clin Pract 1997 3: 213-22

What we don't know is how much resource is consumed by these adverse drug events, though the death toll alone is staggering. We can guess, though, through the example of adverse events due to non-steroidal anti-inflammatory drugs (NSAIDs). These are effective analgesics and are used to treat many patients with arthritis, but cause serious adverse events in some patients (painres/painpag/nsae/nsae.html; Bandolier 79) and cost the NHS an estimated £250 million a year.

We know that in the UK NSAIDs are responsible for about 2,600 deaths due to gastrointestinal bleeding, and 12,000 hospital admissions. We know that a quarter of these admissions are for longer than 14 days, a phenomenal length of stay in modern times. Back of envelope calculations suggest that this single adverse event from a single class of compounds consumes the resources of a single 400-bed hospital. If we extrapolate, but are conservative, then as many as 10 400-bed hospitals in the NHS in the UK are dealing with the consequences of adverse events of drugs.

Can we do anything to prevent it? Sure we can.

There is a systematic review of computer decision support systems. Two thirds show benefit in terms of reducing adverse drug events, and in most of those the size of the benefit is substantial (Bandolier 73).

Two studies, in Boston and Phoenix, of hospital based computer alert systems suggest that adverse drug events can be reduced by half or more, and one showed patient injury reduced by 44% (Bandolier 73). They used two different types of interventions. One depends on putting systems in place to stop mistakes happening. The other depends on real-time interventions to stop mistakes when they happen. Both had a major effect in stopping medication errors in large, complex institutions. Both would improve patient care. Both would reduce costs.

We know that in some situations there are endemic problems. Half of hypothyroid patients get the wrong dose (Bandolier 4). It would cost little to put it right.

Reducing benzodiazepine prescribing in older people is a good thing, because it will help prevent falls and the hip and other fractures that can be so devastating. A simple letter can reduce their use by 30% (Bandolier 4).

Audits can help reduce unnecessary laxative use (Bandolier 65).

Simple interventions can reduce unnecessary antibiotic use (Bandolier 77).

Analgesic prescribing can be improved, using evidence plus simple interventions, and results in improved patient care and lower costs (ImpAct 8; ImpAct 4; Bandolier 40).

Using the best evidence to guide NSAID prescribing substantially reduces hospital admissions (Bandolier 78) due to adverse effects. We know that when presented by classic cases, doctors make suboptimal prescribing choices 30-40% of the time (painres/painpag/nsae/nsae.html).

The waste problem is astonishing. We have identified that perhaps as many as 37 hospitals in the UK, out of a total of 300 odd, that deal only with errors created by the system. On the one hand, this could be regarded something of an over generalisation, though the evidence for much of this is quite firm. On the other hand, we have only considered the big issues. Think about how many small issues of waste there are likely to be affecting this.

Waste consumes at least 1 in 10 of our hospitals, and, one could argue, could consume easily £6 billion of the £40 billion we spend on the NHS. But there is more to come. That stems from fuzzy thinking.

Using our brains

Earlier we discussed the concept of examining costs in the NHS as a whole, rather than just the drug acquisition costs. Because we all too often look just at acquisition costs, we miss opportunities to do better for the NHS and for patients.

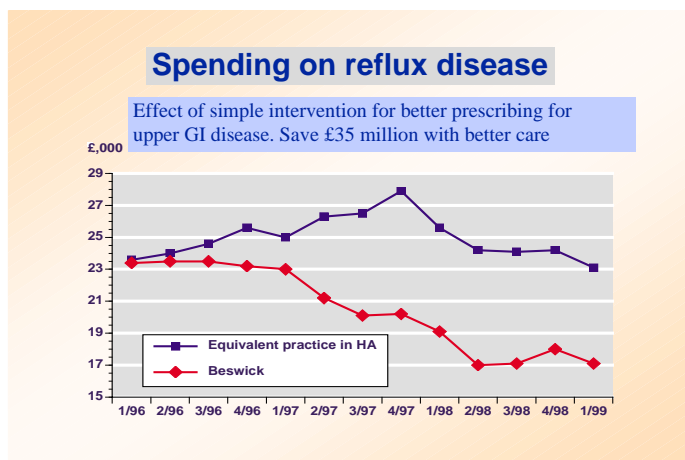
One example is the way in which we use acid suppressing medicines for the treatment of gastro-oesophageal reflux (Bandolier 72). Advice to GPs particularly has been to use a step up treatment. This might involve an initial consultation in which advice is given to change lifestyle: perhaps lose weight, or stop smoking, or raise the head of the bed.

This is unlikely to work, and the second consultation will involve the use of alginates. This also is unlikely to work, and the third consultation might involve the use of histamine antagonists. This might work for some patients, but for most it won't, and the fourth consultation might involve the use of proton pump inhibitors or even a referral to a gastroenterologist for endoscopy before proton pump inhibitors are prescribed.

The evidence is that proton pump inhibitors work best (bandopubs/gordf/gord.html; Bandolier 77), though some GPs are often advised that histamine antagonists are just as effective. They aren't. Together with a health economist I modelled three different ways of treating reflux in primary care, and the results were that the step up treatment took longer and was no more effective than immediate use of proton pump inhibitors, but cost more (slide 14) (Bandolier 77). This was because hospital diagnosis is expensive, and did not even include the potential costs resulting from deaths from endoscopy of about 1 in 2,000 (Bandolier 38).

Strategy	Cost of cure	Cost of non cure	Total cost of cure
Omeprazole	125	126	251
Stepped treatment	201	148	349
Ranitidine	216	568	783

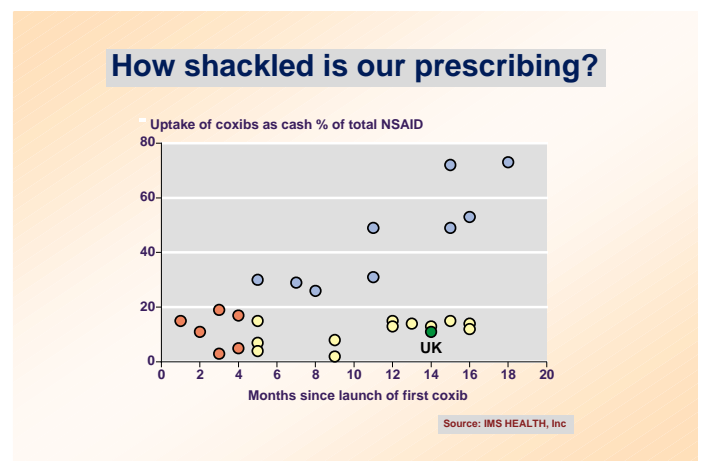
Doctors who look at practical ways of treating patients to achieve the best results, based on good quality evidence, save their practices money (slide 15). For reflux it could be £35 million a year to the NHS (ImpAct 2).



We might think the same way about NSAIDs and the new coxib class of drugs that have the efficacy of the NSAIDs in reducing pain, but do not have the associated gastric adverse effects. We know we can reduce hospital admissions by sensible prescribing (Bandolier 78). We might achieve even better results by sensible uptake of newer, safer, anal-

gesics. Adverse effects of NSAIDs cost the NHS an estimated £251 million a year (painres/painpag/nsae/nsae.html). Sometimes it looks as if we would rather spend money on adverse effects than on better treatments and fitter patients.

If that looks harsh, then have a look at some information on the uptake of coxibs in different countries (slides 16 & 17; Source IMS Health Inc, August 2000). Slide 16 plots the uptake of coxib sales (cash terms) as a percentage of total NSAID sales against the number of months since coxibs were first launched in each country. In the first four months it may be too soon to judge (countries in red). After four months there seem to be a group of countries (blue) where uptake is rapid, and another group (yellow) where uptake is slow. Whether being fast or slow makes any country a hero or a villain (slide 17) perhaps depends on a point of view. If one is not generous, the argument is that the balance of evidence is that the total amount of money spent is about the same, but that slow coxib uptake means that we spend less on drug acquisition and more on patients damaged by NSAIDs.



Heroes or villains

Country	Months	Percent	Country	Months	Percent
South Africa	5	30	Turkey	5	15
Spain	7	29	Poland	5	7
Germany	8	26	Austria	5	4
Australia	11	49	Egypt	9	8
New Zealand	11	31	Finland	9	2
Canada	15	72	Philippines	12	15
Switzerland	15	49	Venezuela	12	14
Puerto Rico	16	53	UK	13	14
USA	18	73	Colombia	14	13
			Peru	14	12
			Argentina	15	15
			Mexico	16	14
			Brazil	16	12

Source: IMS HEALTH, Inc

Doing better

Parts of the NHS do spectacularly well while other parts founder. There are few mechanisms for spreading best practice. Ask a couple of questions:

If the NHS employs a million people, where is the NHS staff college? There isn't one.

Healthcare is delivered by teams. Why do we train by specialty?

Three quick examples of high quality healthcare delivery from the pages of ImpAct:

Slide 18 shows details of a menstrual disorders clinic (ImpAct 5). Using standard management tools the staff of a gynaecology clinic in Leicester transformed a service that took four visits and 16 weeks to come to a diagnosis, to a single-visit, same-day diagnosis. They had help from the terrific laboratory services in Leicester, of course, but they made a difference.

Menstrual disorders clinic

Effect of applying re-engineering principles to healthcare.
An example of from gynaecology in Leicester.

	Before	After
Visits before diagnosis	4	1
Consultation to diagnosis	16 weeks	Same day
Women treated by evidence-based protocols (%)	0	100
Patients seen within 30 minutes (%)	63	99
Patients not attending (%)	9	1
Letters sent to GP the same day (%)	0	78
Appointment made within 24 hours of referral (%)	4	96
Theatre sessions starting late (%)	25	3

In Salford, Manchester, a diabetes clinic introduced shared care between primary and secondary sectors and achieved a similar transformation (ImpAct 4). More were screened. Fewer had raised cholesterol. Amputations fell and blindness in younger diabetics became rare (slide 19).

Diabetes clinics

Effect of sharing care between GPs and hospitals.
An example of from diabetes in Salford.

Key performance indicator	1993	1998
Salford residents with diabetes	4780	5352
Screened in last 18 months (%)	55	73
Total cholesterol <5.5 mmol/L (%)	32	74
Complications		
Diabetes-related amputations (knee)	9	4
Diabetes-related amputations (toes)	15	8
Complications Rate	UK	Salford
Blindness due to diabetes in under 50s (%)	1-4	0.04

East Kent primary care is perhaps my favourite (ImpAct 1). The reason is that it was so audacious. The Medical Advisor, Tony Snell, was not content with a single problem to conquer, he wanted as many as he could get. So primary care standards were set for a range of conditions (slide 20). High standards were set, high standards were met. Most GPs were willing to put the effort in, and the scheme generated massive local pride in what could be achieved.

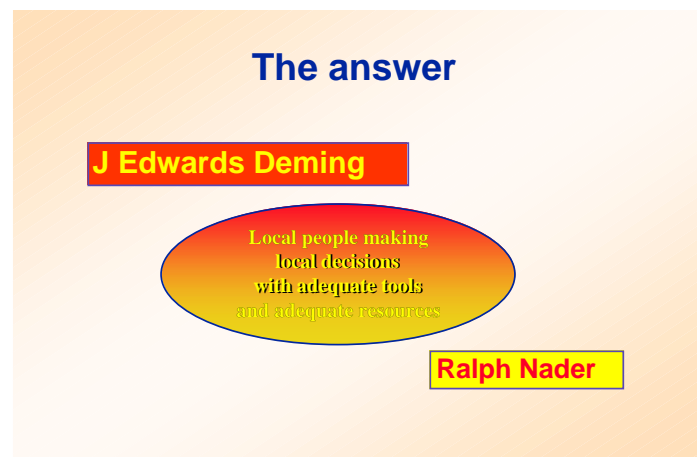
The lesson from all these is that apart from some initial pump priming, much better care was being delivered at essentially the same cost.

Primary care standards

Disease areas covered	Primary care effectiveness in E Kent
Angina	<ul style="list-style-type: none"> Primary care effectiveness in E Kent 80 GPs signed up High standards of care set High standards of care met Massive local pride No 10 impressed
Asthma	
Atrial fibrillation	
Chronic heart failure	
Depression	
Diabetes	
Dyspepsia	
Epilepsy	
Urinary tract infection	
Hypertension	
High cholesterol	
Myocardial infarction	
Venous leg ulcers	

Pulling it all together.

So where are we? Perhaps one lesson is that an answer is to think in terms of the NHS as being between a J Edwards Deming on the one hand and a Ralph Nader on the other (slide 21).



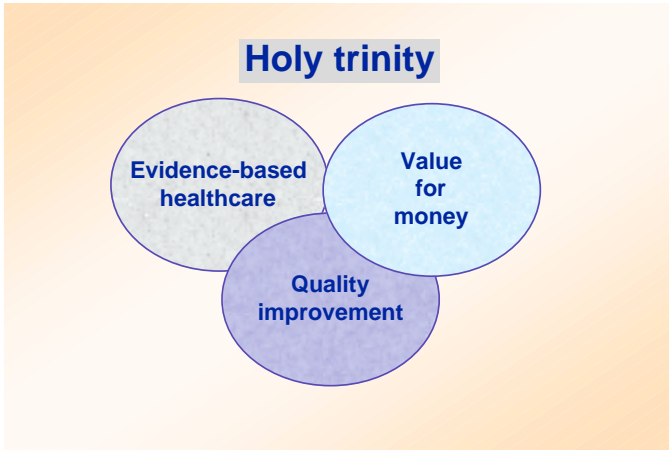
One problem with getting old is that few people know what you mean when bringing up icons from the past. So for the youngsters who may read this:

J Edwards Deming was the statistician who did more than anyone to set rules for quality control in industry. He was ignored in America, his home, but a god in Japan. Which is why the USA drives Toyota cars.

Ralph Nader was (and is) a US consumer lawyer who took on the big corporations for producing goods, especially cars, that were faulty, unsafe, and rusty. He won, which is why we drive safe cars that don't break down or rust. And for the very young, 30 years ago a three year old car with 20,000 miles on the clock was a rustbucket ready for the scrapheap.

We are coming closer to having the holy trinity of evidence-based healthcare, quality improvement and value for money at the centre of the NHS (slide 22).

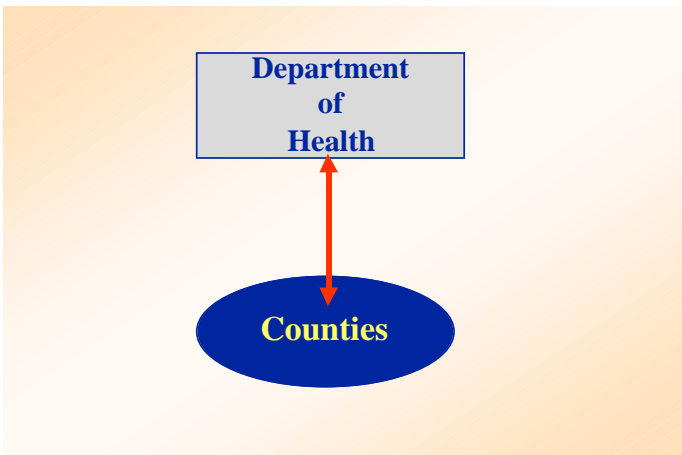
But we still miss out on everything we need to make good things happen in the NHS regularly. For this we need not only evidence on effectiveness, but a sensible and unbiased economic assessment, and both of those have to be com-



bined with mechanisms of change management (slide 23), the area where the NHS is most deficient.

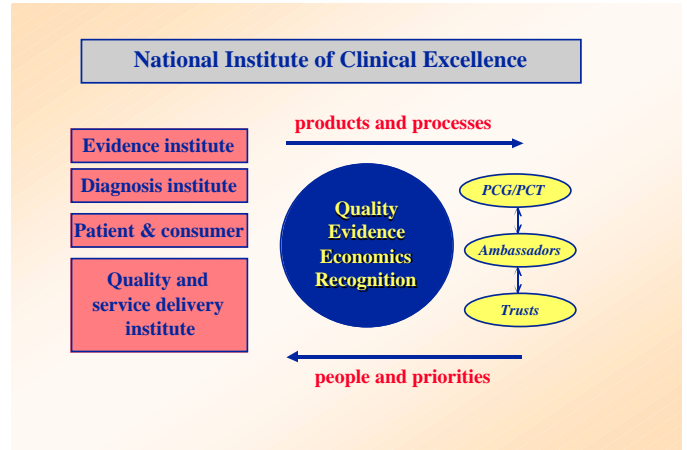


For me the glass is half full rather than half empty, but it could be better. Two structural things could help. First is to recognise that the NHS may be National, but feels local to those inside it. Oxfordshire is a meaningful concept. The South East Region is not. So concentrate healthcare services, with Trusts, and PCGs and Health Authorities, on the Counties, as works so well in Sweden, for instance (slide 24). Everyone in the NHS could sign up to that, and it merges well with local government.



Second would be to reform NICE. I would love to see a national institute for clinical excellence that was, truly, National, an Institute, relevant to Clinical Medicine, and, most of all, Excellent. Right now it has about half a dozen full

time employees trying to do an impossible job. Lets give it £100 million a year, make it the NHS Staff College, with local ambassadors at each County to interact with PCGs and Trusts, with specialist units examining the nature of evidence (EBM with balls), diagnostics, things that matter to patients and consumers, and issues around quality and service delivery (slide 25). Let's make recognition for doing a hard job well something that matters to the NHS.



About 4000 words ago we started with the question: What is the future of the NHS?



Neither up in the air or down in the dumps (slide 26). The answer is that it will probably muddle through much as it has in the past. It will fail to become truly excellent, and will never be truly awful. Bit of a curate's egg (good in parts). For the life of me, though, I fail to see why we should accept second rate when being excellent would be easier and probably cheaper.

October 2000